STUDENT PROJECT 1 - Human Influence on Pig Genetics

Similar to dogs, cats, and other domestic livestock, pigs belonging to the genus and species Sus domesticus have a wide variety of traits, such as size, color, and body shape. Human needs and preferences have largely influenced those differences over time, and we continue to see traits change today.

Where do modern pigs come from?

One theory is that the first "pigs" appeared in Southeast Asia about two million years ago and spread to Eurasia and Africa. Humans hunted wild pigs for food and other resources, and a cave painting that looks like a Sulawesi warty pig (Sus celebensis) was recently found in Indonesia. That cave painting is the oldest known representation of an animal created by humans, estimated at 45,500 years old through carbon dating.

Based on other archeological evidence, it is believed that wild pigs from both Asia (Sus indicus) and Europe (Sus scrofa) were domesticated by humans about 9,000 years ago. However, genetic evidence has shown that most modern pigs, even Asian breeds, share most of their DNA with Sus scrofa, the European wild boar[1].

Scientists believe that coat color may have been one of the first traits humans influenced in their domestic pigs to distinguish them from the wild pigs. Pigs evolved bright coat colors rapidly after domestication thanks to necessity and novelty. Yet gene analysis shows that today's wild pigs are evolving through natural selection to maintain camouflage colors and escape predators' detection.

What factors influenced changes in pig traits?

You will be provided a pig breed (an animal group with many of the same characteristics) to research. Find the information listed to the right and create a slide or poster. Then categorize the pig breeds by type and discuss/answer the questions.

Collect the following information for your pig breed:

- ❑ Name of pig breed
- ❑ Photo or drawing
- ❑ When and where the breed was developed
- ❑ Size, color/pattern, and other unique physical characteristics
- ❑ Noticeable behavior traits (mothering, intelligence)
- ❑ Meat characteristics
- ❑ Age when breed reaches reproductive maturity
- ❑ Average litter size
- ❑ Best or typical environment
- ❑ Why was the breed developed, or if the information has not been provided/found, why do you think this breed was developed?
- ❑ Has the breed changed over time to have different traits?

Present your breed information to the other students in class. Then decide if the breed is considered a **modern livestock** breed, **heritage livestock** breed, or **pet-type** breed. Does it belong in more than one category?

You may also want to **create a timeline** of pig breeds, placing them in chronological order of development.

Discussion Questions:

1. What factors had the largest impact on how pig breeds were developed? Discuss geography, climate, how the pigs were handled and fed, how the pig was used (food and resources), culture, and health.
2. At what points in history did you see a shift in traits? What encouraged the change?
3. How may humans influence genetic variation in the future?
4. What would your "perfect" pig breed look like?

[1]E Giuffra, J M H Kijas, V Amarger, Ö Carlborg, et all, 2000 The Origin of the Domestic Pig: Independent Domestication and Subsequent Introgression Genetics 154-4: 1785–1791 https://doi.org/10.1093/genetics/154.4.1785